Supporting Information

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SI Text

Revision of the Identification of the Suids and So-Called "Fallow Deer" Bones from Akrotiri *Aetokremnos*. Visual examination of the 18 pig and "deer" bones and tooth from Akrotiri *Aetokremnos* led us to modify some of the determinations proposed by Reese (1, 2) for the phalanges. This has already been mentioned by 2 of the coauthors of this paper [F.P. and J.-D.V., cf. footnote 1, in chapter by Reese (2), p 167]. For example, the bone represented in figures 7 and 8 (p. 166) of that chapter, which was originally determined as "phalanx 2; UF and epiphysis" (FN1022 N98E90), was, in fact, an unfused (UF) abaxial first phalanx. Abaxial digits II–V in suids are of reduced size compared with axial (III–IV) ones (Fig. S1). Morphometrical and morphoscopic evidence shows that the 4 *Aetokremnos* phalanges attributed to *Dama* actually belong to suids (See examples in Fig. S2 *A*–*C*). We based our comparison on axial and abaxial phalanges of the following:

- the skeleton of a modern male European wild boar (Compiègne forest, France; collection of Amathous mission at Ayios Tychonas, French School at Athens, Cyprus),
- the series of suid phalanges from section 3 at *Shillourokambos* (Parekklisha, Limassol district), a rare early Pre-Pottery Neolithic Cypriot site which offers a series of well preserved and measurable abaxial phalanges dated to between 9,700 and 9,000 cal BP (3),
- the axial phalanges from the large series of Mesopotamian fallow deer and suids from section 1 at *Shillourokambos* dated to between 10,000 and 9,000 cal. BP (4, 5).

We measured the greatest length (GL), peripheral greatest length (GLpe), and proximal breadth of the first and second phalanges and the dorsal length (Ld) and dorsal sole length of the third phalanges, according to von den Driesch (6). According to the same standards, we took the same measurements for the abaxial phalanges, which are not usually measured by archaeozoologists. We also measured the maximal length and the minimal diameter of the diaphysis of the UF first phalanges. Because some of these measurements are redundant, we only present the results of GL, GLpe, and Ld. Because our own measurements of the *Aetokremnos* bones did not significantly differ from the ones published by Reese (1, 2), we used the latter.

Fig. S3 shows that the reference modern European boar is slightly larger than the *Shillourokambos* suids for all the measurements except the abaxial third phalanges. This means that there are important allometries between axial and abaxial suid phalanges.

Concerning *Aetokremnos*, Fig. S3 also shows that:

- the size of the first phalanx ref. FN 1021, attributed by D. Reese to *Dama*, plots outside the range of variation of the Cyprus Pre-Pottery fallow deer and within that of the *Sus* phalanges (Fig. S3 *A* and *C*);
- the only available measurement for the other first phalanx that was attributed to *Dama* (FN 402), GL = 39 mm, is slightly smaller than the variation range of the Cyprus Mesopotamian fallow deer (Fig. S3*A*), but fits very well that of *Sus* on Fig. S3*B*; also its shape is typical of *Sus* phalanges (as shown in Fig. S2*B*);
- the specimens considered by Reese (1) as second phalanges of suids plot at an intermediate position between the axial and abaxial second phalanges of *Sus* (Fig. S3*A*); rather, they plot within the range of abaxial first phalanges (fused and unfused) of the reference suids, from both *Shillourokambos* and modern Europe (Fig. S3*B*); this observation supports the new determination that we proposed based on Fig. S2*A*;
- the suid third phalanges of Reese (1) are too small for being from axial digits of adult suids (Fig. S3*A*); they come either from axial digits of young suids or, more probably, from abaxial ones (Fig. S3*B*);
- the measurements of the third phalanges that Reese (2) attributed to *Dama* are compatible with our reference bones of both *Dama* and suids (Fig. S3*A*,*B*), and it is only possible to exclude an identification of deer based on their shape (Fig. S2*C*).

Consequently, it appears that Reese (1, 2) made 3 systematic misinterpretations:

He attributed the axial first phalanges of suids to *Dama*.

He took the abaxial first phalanges of suids as the second phalanges of the same taxon.

He ignored the axial/abaxial dimorphism of the terminal phalanges of suids [in ref. 1(table 7–7, p. 165), he never mentioned the axial/abaxial position of third phalanges]; rather, he systematically attributed the smallest of them (abaxial or axial of young animals) to *Sus* and the largest ones (axial) to *Dama*, whereas the latter are, in fact, suid axial third phalanges (Fig. 1). Table S1 summarizes our modification of the anatomical and taxonomic determination. It only bears on phalanges, the incisor (right lacteal first upper incisor), and the metapodials having been correctly determined (1). Finally, the anatomical attributions of 3 of the 14 specimens attributed to *Sus* were wrong, and the 4 so-called "*Dama*" phalanges are actually suid phalanges. In conclusion, the 17 bones and the tooth all belong to *S. scrofa*.

Skeletal Representation, Age, and Minimal Number of Individuals. The revised list of correct identifications (Table S1) consists of 1 upper right lacteal incisor, 4 abaxial metapodials coming from both forelimbs and rear limbs, 5 first phalanges (2 axial, 3 abaxial), and 8 third phalanges (2 of them only coming from axial digits of adult suids). As such, this set of bones describes no more than 1 individual. Moreover, the similarities between the measurements of all the phalanges (Fig. S3) could suggest that they all come from the same pig (although, as stated, the smallest third phalanges could come from adult abaxial digits or from young axial digits). However, according to the age of epiphyseal fusion of modern wild boar (7), the presence of both fused and UF phalanges indicates the presence of at least 2 individuals. The younger died before 21 months of age (as indicated by the UF first phalanges and, maybe, the smallest third phalanges), and the older died after 25 months of age (fused metapodials). Theoretically, the first lacteal incisor could have belonged to the younger individual, because its replacement by the adult tooth takes place over *ca.* 24 months (8). It may, however, have belonged to a third individual of slightly younger age, because the resorption of the root has not yet started. According to the high rate of variability of both the age of epiphyseal fusions and the age of incisor replacement, it seems, however, more cautious to assess a minimum number of 2 individuals.

The total absence of second phalanges, either axial or abaxial, may be attributable to the fact that their shape is not very different from the abaxial second phalanges of hippopotami. We cannot exclude the possibility that they have been left among the huge number of hippopotami phalanges as well as, maybe, some other suid bones.

References for Osteometric Comparisons.

Final Late Glacial (Late Dryas, *ca.* 14,000–12,000 cal. BP) wild boar:

- Mallaha (Natoufian; Eynan, Israel; ref. 9): 6 second phalanges (ref. 10, p. 156); the measurements of this assemblage were taken in a slightly different way to the other sites (compare ref. 6 p. 86–87, with ref. 10 p. 176–178),
- Dederyieh cave (Natoufian layers only: 13,000–12,900 cal. BP; Syria; ref. 11): four second and one third phalanges (12),
- Mureybet (Middle Euphrates valley, Syria; ref. 12); 10 axial second phalanges (13); we only took into consideration the measurements of the Natoufian and Khiamian levels (Mureybet I and II, respectively).

Pre-Pottery Neolithic B (PPNB, 10,000–9500 cal. BP): early domestic suids:

- Cafer Höyük (Early and Middle PPNB; Malatya, Turkey; ref. 14): 12 second and 3 third phalanges (15),
- Tell Aswad (Middle PPNB; Damascus, Syria; ref. 16): 22 second and 14 third phalanges (17).

Pottery Neolithic (7th millennium cal. B.P.): Neolithic domestic pig and wild boar:

- Newe Yam (Wadi Rabah culture; Atlit, Israel; 18): two second phalanges of Neolithic domestic pig and a second phalanx of a Neolithic wild boar.

In addition, we used Corsican data as a reference for small Neolithic island domestic pigs [19 (microfiche)], including the Early Neolithic layers at Basi (layer 7: eighth millennium cal. B.P., 7 second phalanges), the Middle Neolithic layers at Araguina-Sennola (layer 16: fifth millennium cal. B.P., 5 second and 3 third phalanges), the late Neolithic layer at Basi (layer 4: fourth millennium cal. B.C., 3 second phalanges), and the Chalcolithic site at Terrina IV (third millennium cal. B.C., 1 second phalanx).

Statistical Methods and Calculations for Size Comparisons. We processed pair-wise comparisons between GLpe of the second phalanges, Ld of the third phalanges, or phalanx log size indexes. We tested the differences of variance (F test) and the differences of means (Student t test). The conditions of a normal distribution and of nonsignificant differences between variances could not be tested because most of our samples are of small size. Consequently, we also used the Welch t test (unequal variances) and the Monte Carlo permutation test (no parametric conditions). All the statistical tests were processed with the PAST package [PAlaeontological STatistics, ver. 1.43 (20)]. Results are given in Table S2.

Estimation of the Size Reduction of the *Aetokremnos* Pigs. The GLs of the 2 axial first phalanges of suids at *Aetokremnos* are 35.0 and 39.0 mm. These measurements are, respectively, 9.4 and 18.7% smaller than the mean values of Mureybet I–II ($n = 8$, mean = 43.06 ± 2.87 mm). Mallaha cannot be taken as a reference here, because the measurements (10), as noted previously, were taken slightly differently than at *Aetokremnos* and Mureybet. The Lds of the 2 axial third phalanges of suids at *Aetokremnos* are 29.5 and 32.3 mm. With reference to the only value available for Dederyieh (40.5 mm), these axial third phalanges from *Aetokremnos* are, respectively, 20.2 and 27.2% smaller.

1. Reese DS (1999) in *Faunal Extinction in an Island Society. Pygmy Hippopotamus Hunters of Cyprus*, ed Simmons A (Kluwer Academic–Plenum Publishers, New York), pp 164–167.
2. Reese DS (1999) in *Faunal Extinction in an Island Society. Pygmy Hippopotamus Hunters of Cyprus*, ed Simmons A (Kluwer Academic–Plenum Publishers, New York), p 167.
3. Vigne J-D (2009) New morphometric data in Shillourokambos (Perreklisha, Limassol, Cyprus), Third sector, eds Guilaine J, Briois F, Vigne J-D (Ecole Française d'Athènes, Athens) (in French), in press.
4. Vigne J-D (2009) Suids (*Sus scrofa*) in *Shilourokambos (Parreklisha, Limassol, Cyprus) and the Cyprus Early Prepottery*, eds Guilaine J, Briois F, Vigne J-D (Ecole Française d'Athènes, Athens) (in French), in press.
5. Vigne J-D (2009) Fallow deer (*Dama mesopotamica*) in *Shilourokambos (Parreklisha, Limassol, Cyprus) and the Cyprus Early Prepottery*, eds Guilaine J, Briois F, Vigne J-D (Ecole Française d'Athènes, Athens) (in French), in press.
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7. Bridault A, et al. (2000) Wild boar (*Sus scrofa* L.)—Age at death estimates: The relevance of new modern data for archaeological skeletal material. 1. Presentation of the corpus. Dental and epiphyseal fusion ages. *Ibex Journal of Mountain Ecology* 5—*Anthropozoologica* 31:11–18.
8. Silver A (1969) in *Science in Archaeology*, eds Brothwell DR, Higgs ES (Thames & Hudson, London), pp 283–302.
9. Valla A, et al. (1999) The final Natufian and the new excavations at Mallaha (Eynan), Israel 1996–1997. *Journal of the Israel Prehistoric Society* 28:171–176 (in French).
10. Ducos P (1968) *Origin of the Domestic Animals in Palestine* (Institut de Préhistoire de l'Université de Bordeaux, Bordeaux, Mémoire 6) (in French).
11. Yoneda M, et al. (2002) in *Recent Advances in Anthropology and Primatology,* eds Ishida H, Nakatsuka M, Ogiwara N (Anthropological Society of Nippon and Primate Society of Japan, Kinseisha, Kyoto), pp 31–34.
12. Ibañez JJ, ed (2008) *Tell Mureybet, a Neolithic Site in the Syrian Middle Euphrates Valley* (British Archaeological Reports, Oxford) (in French).
13. Gourichon L, Helmer D (2008) in *Tell Mureybet, a Neolithic Site in the Syrian Middle Euphrates Valley,* ed, Ibañez JJ (British Archaeological Reports, Oxford), pp 115–227 (in French).
14. Cauvin J, Aurenche O (1982) The Neolithic at Cafer Höyük (Malatya, Turquie). Excavation sessions 1979–1980. *Cahiers de l'Euphrate* 3:123–138 (in French).
15. Helmer D (2008) in *Archaeozoology of the Near East VIII*, eds Vila E, Gourichon L, Choyke AM, Buitenhuis H (Maison de l'Orient et de la Méditerranée, Lyon, France, TMO 49), pp 169–195.
16. Stordeur D (2003) Modelled skulls at Tell Aswad in Damascus area (PPNB, Syria). *Paléorient* 29(2):109–116 (in French).
17. Helmer D, Gourichon L (2008) in *Archaeozoology of the Near East VIII*, eds Vila E, Gourichon L, Choyke AM, Buitenhuis H (Maison de l'Orient et de la Méditerranée, Lyon, France, TMO 49), pp 119–151.
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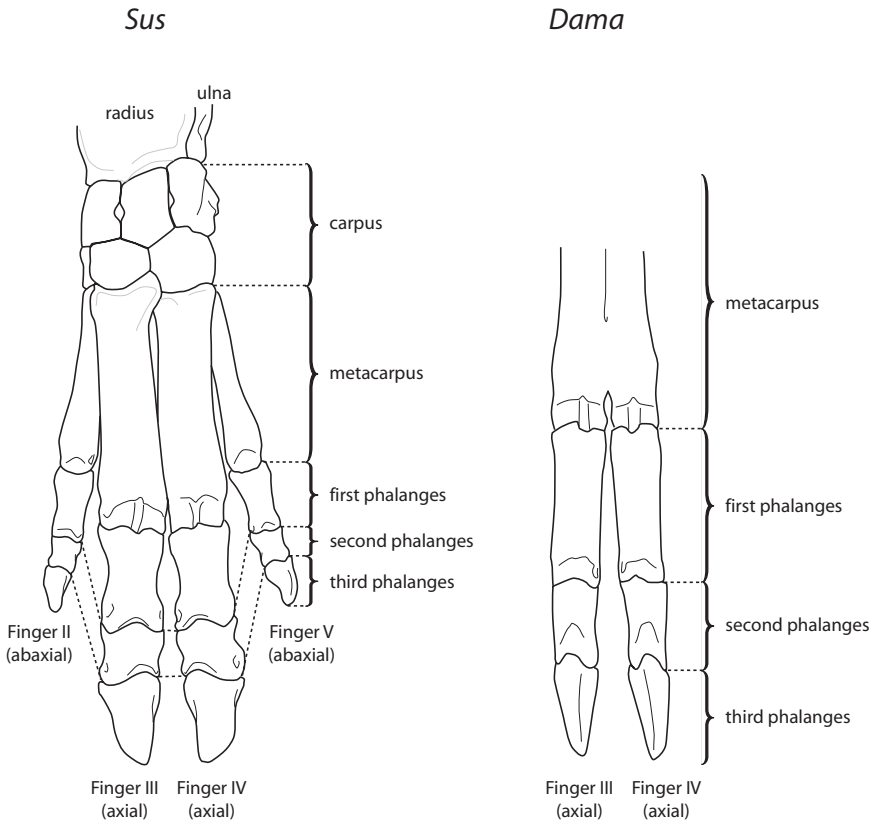

Fig. S1. Dorsal views of the left anterior limb skeleton of a pig (*Sus*) and a deer (*Cervus*/*Dama*) showing the axial and abaxial digits. Drawings courtesy of J.-D. V. [after Barone R (1976) *Anatomie comparée des Mammifères domestiques*, 1, *Ostéologie* (Vigot Frères, Paris)].

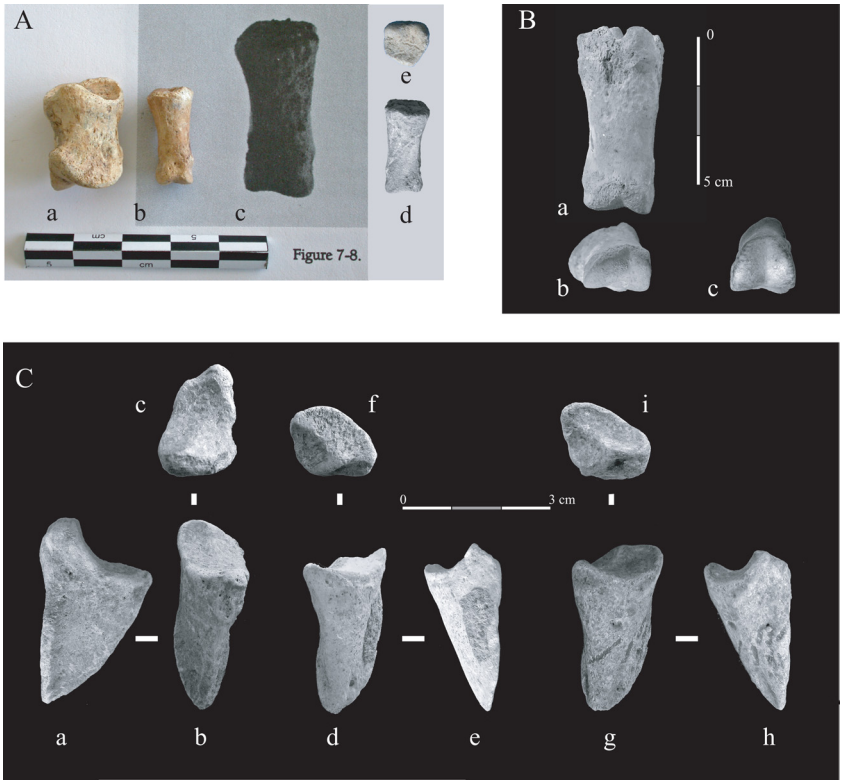

Fig. S2. Taxonomic determination of the *Aetokremnos* phalanges. (*A*) Example of the erroneous anatomical identification of an *Aetokremnos* suid first phalanx: dorsal view of an axial second phalanx of suid (*Shillourokambos*, section 3, US 1,000) (*a*); dorsal view of an UF abaxial first phalanx of suid (*Shillourokambos*, section 3, US 1,000) (*b*); reproduction of the left bottom part of figures 7 and 8 of Reese (1) (*c*) showing the specimen FN1022 N98E90, which he determined as ''phalanx 2; UF and epiphysis''; and our pictures of the proximal epiphysis (*e*) and the diaphysis (*d*) of this FN1022 N98E90 specimen, at the same scale as for *a* and *b*. The photograph by Reese (1) did not have a scale, which explains the apparent difference of size between specimens *a* and *b* and picture *c*. (*B*) Revision of the determination of the axial first phalanges of suids from *Aetokremnos*, which have been previously attributed to the fallow deer by Reese (2): dorsal view of FN1021 N99E89 (*a*); distal view of the distal articulation of the same specimen (*b*); and, for comparison, distal view of the distal articulation of a first phalanx of a modern European red deer (*Cervus elaphus*, very similar to *Dama mesopotamica*; collection of the Archaeozoology Laboratory, Paris) (*c*). (*C*) Comparison of a third axial phalanx of *Dama* (*a*–*c*) with a third axial phalanx of suid (*d*–*f*) and with a third axial phalanx of *Aetokremnos* (*g*–*i*), which were attributed, by mistake, to *D. mesopotamica* by Reese (2); the 2 first phalanges come from the Preceramic Neolithic of *Shillourokambos*, and the 3 specimens are presented in lateral (*a*, *e*, and *h*), dorsal (*b*, *d*, and *g*) and proximal (*c*, *f*, and *i*) views. (Pictures and composition courtesy of J.-D.V.).

1. Reese DS (1999) in *Faunal Extinction in an Island Society. Pygmy Hippopotamus Hunters of Cyprus*, ed Simmons A (Kluwer Academic–Plenum Publishers, New York), p 164.
2. Reese DS (1999) in *Faunal Extinction in an Island Society. Pygmy Hippopotamus Hunters of Cyprus*, ed Simmons A (Kluwer Academic–Plenum Publishers, New York), p. 167.

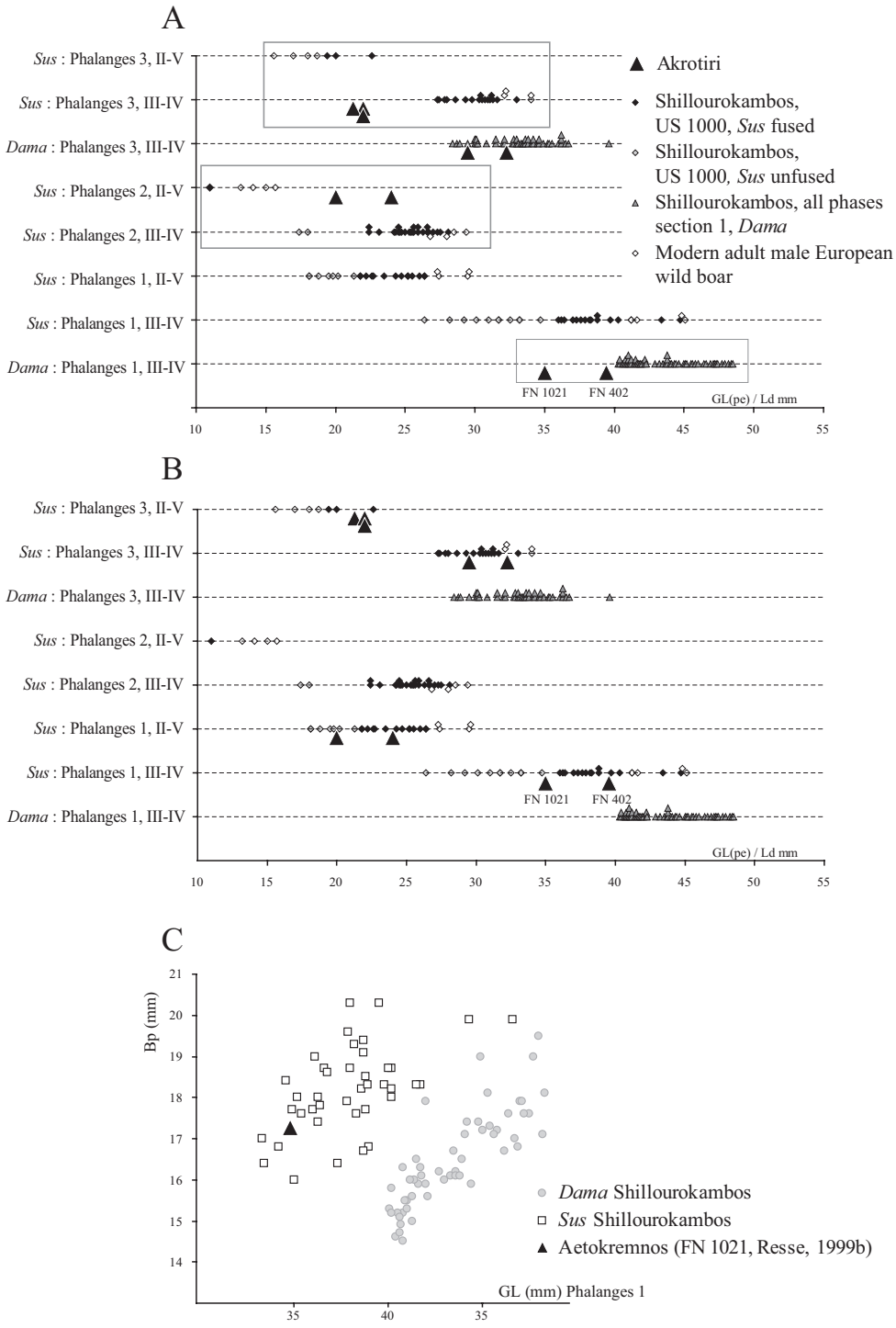

Fig. S3. Comparison of the measurements of the Akrotiri *Aetokremnos* suid phalanges after Reese (1, 2) with the modern and Prepottery references: according to the anatomical and taxonomic identifications proposed by Reese (1, 2) (*A*, inconsistencies are emphasized by gray frames); according to our anatomical and taxonomic revisions (*B*); and plotting the measurements of the first phalanx FN1021 attributed to *Dama* by Reese (2) on the scatter diagram of the measurements of the axial first phalanges of the Prepottery suids and fallow deer at Shillourokambos, section 1 (*C*). Bp, proximal breadth.

1. Reese DS (1999) in *Faunal Extinction in an Island Society. Pygmy Hippopotamus Hunters of Cyprus*, ed Simmons A (Kluwer Academic–Plenum Publishers, New York), pp 164–167.
2. Reese DS (1999) in *Faunal Extinction in an Island Society. Pygmy Hippopotamus Hunters of Cyprus*, ed Simmons A (Kluwer Academic–Plenum Publishers, New York), p 167.

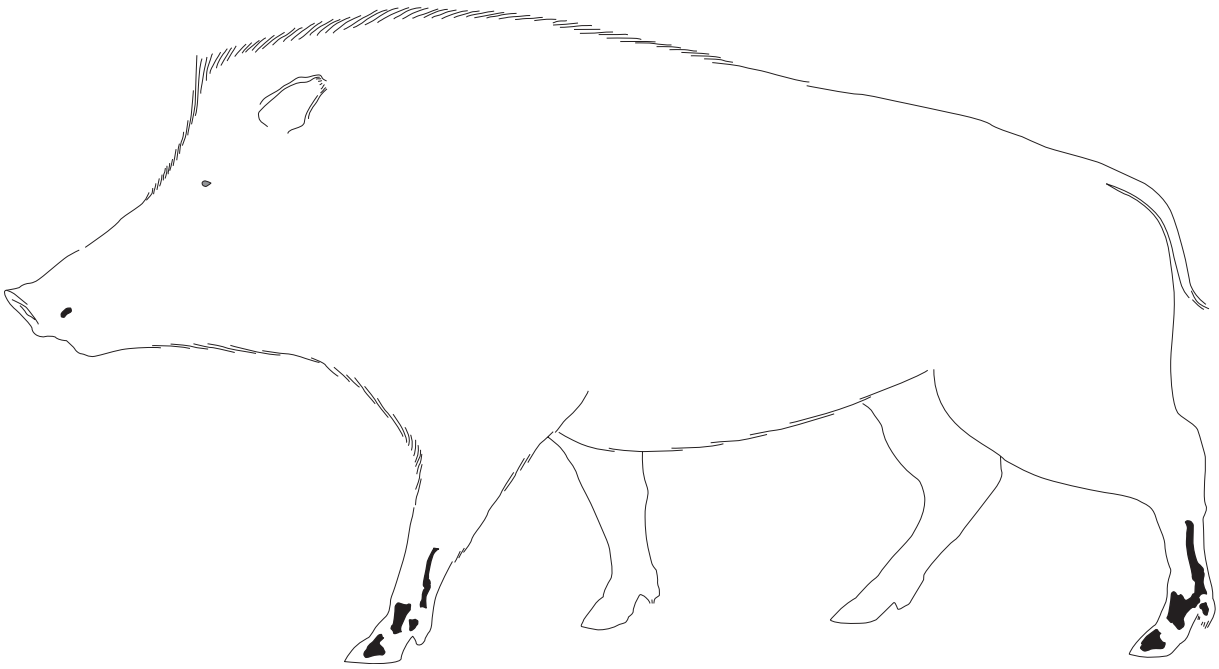

Fig. S4. Representation of the skeletal parts of suids at Akrotiri *Aetokremnos*, according to our identifications. Drawing courtesy of M. Coutureau, Institut National de Recherche en Archéologie Préventive (INRAP), Bordeaux, France [after Pales L, Garcia MA (1981) *Mammifères du Quaternaire* (CNRS, Paris) (in French)].

Table S1. List of the specimens of Akrotiri *Aetokremnos* attributed to *Sus* and to *Dama* by Reese, the anatomical attributions made by the same author, and the results of our anatomical and taxonomic revisions

		Determinations after Reese (1, 2)		Our precisions and modifications	
Layer	Reference	Anatomical part	Taxon	Anatomical part	Taxon
2	FN1138 N97E90	Phal. 2 (abaxial)	*Sus*	Phal. 1 (abaxial)	
		Phal. 3 (broken)	*Sus*	Phal. 3 (abaxial)	
2	FN422 N98E89	Phal. 3	*Sus*	Phal. 3 (abaxial)	
2	FN320 N96E91	Metatarsal V	*Sus*		
2	FN1022 N98E90	Incisor	*Sus*	First right upper lacteal incisor	
		Metapodial II/V	*Sus*		
		Metacarpal II	*Sus*		
		Phal. 2 UF and epiphysis	*Sus*	Phal. 1 (abaxial) UF and epiphysis	
2, lower	FN866 N96E89	Phal. 3	*Sus*	Phal. 3 abaxial or young axial	
4B	FN367 N97E87–88	Metapodial II/V	*Sus*		
		Phal. 3	*Sus*	Phal. 3 abaxial or young axial	
4B	FN385 N99E87	Phal. 3	*Sus*	Phal. 3 abaxial or young axial	
	FN506 N99E87	Phal. 2 UF	*Sus*	Phal. 1 abaxial unfused	
		Phal. 3	*Sus*	Phal. 3 abaxial or young axial	
1/2	FN402 N96E87	Phal. 1	*Dama*	Phal. 1 (axial)	*Sus*
2	F1021 N99E89	Phal. 1	*Dama*	Phal. 1 (axial)	*Sus*
2, lower	F340 N96E91	Phal. 3	*Dama*	Phal. 3 (axial)	*Sus*
3	F914 N96E89	Phal. 3	*Dama*	Phal. 3 (axial)	*Sus*

Phal., phalanges.

Table S2. Mean, SD, and dispersion coefficient (100 × mean/SD, %) of the measurements of the suid phalanges of US 1,000 at *Shillourokambos*, which have been taken as references for the log size index calculations

		GL/Ld, mm		
	N	Mean	SD	Dispersion coefficient
Phalanges 1 axial	16	38.86	2.50	6.42
Phalanges 1 abaxial	14	24.16	1.70	7.04
Phalanges 1 unfused abaxial	7	19.40	1.17	6.01
Phalanges 2 axial	25	25.40	1.48	5.83
Phalanges 3 axial	17	29.95	1.64	5.48
Phalanges 3 abaxial	3	20.67	1.70	8.23

1. Reese DS (1999) in *Faunal Extinction in an Island Society. Pygmy Hippopotamus Hunters of Cyprus*, ed Simmons A (Kluwer Academic–Plenum Publishers, New York), pp 164–167.
2. Reese DS (1999) in *Faunal Extinction in an Island Society. Pygmy Hippopotamus Hunters of Cyprus*, ed Simmons A (Kluwer Academic–Plenum Publishers, New York), p 167.

Table S3. Results of the statistical tests processed according to the method described in *SI Text Archaeozoological Analyses*

		N		Measurement/Index			Variance comparison,		Mean comparison					
Sample 1	Sample 2	*N*1	*N*2	Glpe P2	Ld P3	LSI	*F*	*p* (*F*)	|t|	*p* (*t*)	|t| (Welch)	*p* (*t*′)	Permutation	Result
Mallaha	Mureybet	6	10	X			3.537	0.096	2.30	0.037	1.970	0.0902	-	ns
Mureybet	Dederyieh	10	3	X			1.841	0.427	0.99	0.342	0.830	0.474	0.3500	ns
Mureybet	Dederyieh	10	4			X	4.612	0.064	1.99	0.070	1.445	0.229	0.0620	ns
Dederyieh + Mureybet	Aetokremnos	14	10			X	1.358	0.656	5.45	1.80E-05	5.590	1.50E-05	0.0000	+++
Mureybet	Aetokremnos	10	10			X	1.720	0.431	5.35	4.35E-05	5.350	5.45E-05	0.0000	+++
Aswad	Cafer Höyük	22	12	X			1.877	0.207	0.85	0.401	0.776	0.448	0.4200	ns
Aswad	Cafer Höyük	14	3		X		2.580	0.627	1.35	0.196	1.840	0.130	0.1990	ns
Aswad	Cafer Höyük	36	15			X	1.680	0.212	0.26	0.796	0.233	0.817	0.8030	ns
Aswad + Cafer Höyük	Aetokremnos	51	10			X	1.885	0.309	4.28	7.00E-05	5.289	6.70E-05	0.0000	+++
Gürçü Tepe II-III	Aetokremnos	18	10			X	1.579	0.491	0.26	0.798	0.276	0.785	0.7960	ns
Aetokremnos	Corsica	10	15			X	1.832	0.363	0.71	0.485	0.754	0.458	0.4750	ns

Tests were processed with the PAST package. *F*, statistic parameter of Fischer (comparison of variances); GLpe P2, greatest length of the axial second phalanges; Ld P3, dorsal length of the axial third phalanges; LSI, log size index (see SOM text 6); *N*, total number of specimens; ns, not significant; *P*, probability; permutation, probability that the 2 samples are the same by the Monte Carlo permutation test; *t*, statistic parameter *t* of Student (comparison of means); *t*′, statistic parameter *t* of Welch (comparisons and means with different variances).

1. Reese DS (1999) in *Faunal Extinction in an Island Society. Pygmy Hippopotamus Hunters of Cyprus*, ed Simmons A (Kluwer Academic–Plenum Publishers, New York), pp 164.

2. Reese DS (1999) in *Faunal Extinction in an Island Society. Pygmy Hippopotamus Hunters of Cyprus*, ed Simmons A (Kluwer Academic–Plenum Publishers, New York), p 167.